ASTRONOMICAL SOCIETY OF LONDON.

February 8, 1828. No. 9.

Report of the Council of the Society to the Eighth Annual General Meeting, held this day.

Your Council are happy in being able to commence this, their Eighth Report, with a general expression of congratulation on the progress of the Society, and on the prospects of increased and increasing utility, which a view of its actual state and resources, and a consideration of the events of the year now closed, in their minds, appear to justify. They trust, too, that a review of these events will at the same time justify the confidence reposed in them, by shewing that they have not been neglectful of the opportunities which have offered, of advancing in various ways the objects and interests of the Society.

One of the first acts of the Council of the year elapsed, was to enter into an arrangement with Mr. Taylor, the printer to the Society, and who is also one of the editors of the Philosophical Magazine, for the publication of a series of monthly notices of its proceedings, and for the supply of a sufficient number of copies of them, in succession, for distribution among the members. The convenience and advantages of this plan have been sufficiently proved by the trial which has been given it, and it will of course be continued. The public is hereby brought more immediately into contact with the Society — the labours of its contributors are canvassed and discussed, while the interest of the author in his subject is yet warm, and when the interchange of ideas respecting it is most beneficial, not only to the public, but to the author himself, whose views may, and probably in many instances will, be enlarged or corrected by such intercourse. An authentic, and at the same time public, record is, as it were, opened, of the papers read, and the outlines of their contents rendered matter of history; — thus affording ready means of establishing the claims of authors to priority of discovery, so far at least as priority of public communication can be regarded as evidence in questions of that nature. The same arrangement offers the further advantage of relieving the Council from all difficulty in the disposal of matter of merely temporary interest; such as notices of phenomena, ephemerides of the smaller planets, comets, &c. which require speedy circulation, and do not need to be formally enrolled in the *Memoirs;* and it may occasionally happen, that the matter of more regular communications may so far be condensed into the monthly abstract, as to dispense with a second publication in the Memoirs — to the material relief of the funds of the Society.

The same consideration of the advantages derived from the

speedy publication of communications read to the Society, has induced the Council to adopt the principle of sending immediately to press all papers which, on passing through the prescribed formalities, shall be deemed of a nature for publication in their Memoirs; and although objections have been considered to exist against the separate publication of each particular memoir, the division of their volumes into smaller parts can be attended with no inconvenience. Acting on this principle, the Council have directed the publication of Part I. Vol. III. of the Memoirs, including all papers (regarded by them as suitable for printing in the body of the Memoirs) read during the interval elapsed from the last publication. This Part is now, accordingly, before the public, and furnishes satisfactory proofs of the zeal, diligence, and talents, both of our Home Members and our Associates.

It is not merely, however, in communicating to the world the observations of their members, but also in causing observations to be made, and in lending every assistance in their power to those meritorious and public-spirited individuals, who, actuated only by an earnest desire to render available their leisure and talents in the cause of science, are willing to undertake the task of regular observation,—that a Society like this can render service to science. The munificent act of a private individual has happily placed this particular line of utility more directly than heretofore in the power of the Society; and its members have not been slow in availing themselves of its advantages, and applying them to effective use.—Among the great and lamented losses which the Society has sustained in the course of the last year, is that of the late Colonel Mark Beaufoy; the latter days of whose existence we recollect, with a melancholy pleasure, to have been cheered and gratified by the highest mark of this Society's approbation, in the award of their medal for his astronomical observations. His son, Lieut. George Beaufoy, has, with the utmost liberality, placed his deceased father's astronomical instruments in the possession of this Society. It would be doing an injustice to the public spirit and good feeling which have dictated this act, not to record it in his own words. The following, then, is a copy of the letter, announcing the donation.

Bushy Heath, 5th June, 1827.

Sir,—My father, Colonel Mark Beaufoy, has bequeathed his principal instruments to me; an arrangement in which I am confident he has consulted my feelings rather than his own inclination.

Permit me then, Sir, in his name, to offer these instruments to the Astronomical Society.

Should the President and Council honour me by the acceptance of this offer, be pleased, Sir, to assure them, that Colonel Beaufoy never flattered himself that the gift would be worthy of being presented to so scientific a body; but he nevertheless continued, until the latest hour of his life, to take an intense interest in the prosperity of the Astronomical Society,—doubly endeared to him by the association of valued friends, and by the sincere conviction which he felt, that the success of the Society

was pre-eminently identified with the general diffusion and advancement of the science of astronomy.

I have the honour to remain,
Sir,
Your very obedient, humble servant,

W. S. Stratford, Esq. G. Beaufoy.
Secretary to the Astronomical Society.

The instruments consist of
One 4-feet Transit, by the late Mr. Cary, Strand.
One Altitude and Azimuth Circle, by the same.
One Clock, adjusted to mean Solar time.
One Clock, adjusted to Sidereal time.

Your Council conceive, that the opportunity fortunately placed before them, by Lieut. Beaufoy's recent election as a member of this Society, of marking their sense of this liberal and public-spirited conduct on his part, by a high and complimentary distinction, ought not to be neglected. They have therefore thought it advisable to recommend to the Society to elect him a member for life.*

The Council wish to observe, with respect to the measure so recommended, that though it may seem equivalent to the acknowledgment of a class of members similar to that which, in the constitutions of some scientific bodies, are deemed honorary members,—yet they are rather desirous to avoid the establishment of purely complimentary distinctions, and to mark by it, in this and any future case which may occur, the Society's sense of some distinct benefit accruing to itself or to astronomical science, through the individual so distinguished, which could not be properly acknowledged otherwise;—thus leaving every future case to rest on its own individual merits, as if it were the first of its kind.

The surest criterion of the utility of a donation is its immediate and effective practical application. That of Lieut. Beaufoy was scarcely announced to the Council, when an application was made to them by one of our members, Captain Smyth, R.N. (justly distinguished for his knowledge of the resources of practical astronomy), for their loan, which was immediately accorded; and the Council have the high satisfaction of being able to announce to you, that the instruments in question are at this moment (with the exception of one of the clocks) mounted in the best manner, in a regular observatory established by Captain Smyth, at his residence at Bedford, for their express reception, and already in actual use in celestial observation. The Council, though not unaware of the general nature of Captain Smyth's astronomical views, purposely forbear from publicly stating at present the course of observations in which he purposes to engage; being desirous to leave his meritorious exertions as far unfettered as possible by any public pledge — and trusting rather to his high character and well-known zeal, talent, and activity, than to any express stipulation, that the means thus placed in his hands will be exerted for the advancement of astronomical science.

* [A Resolution to this effect was unanimously adopted at a General Meeting.—Sec.]

Actuated by a similar desire to promote, as far as our means will admit, the great objects of astronomical inquiry in all its branches, the Council have ordered two invariable pendulums, of iron and of copper, on a construction somewhat different from those hitherto employed, to be consigned to Captain Foster, for the purpose of investigating the possible effect of the earth's magnetism in various geographical positions, in these delicate researches, in the course of his approaching scientific voyage; an enterprise which honourably characterises the enlightened views of government, and from which a rich harvest of important results may be anticipated.

From the report of the Finance Committee it appears that the funds of the Society continue in a flourishing state, notwithstanding the heavy demands for computation and printing during the last year. This extraordinary expenditure has principally arisen from the great expense incurred in publishing the Catalogue of the principal fixed stars, alluded to in the last Report, and which appears to have met the approbation of every astronomer. But the Council are happy to state, that this disbursement has been followed by a corresponding spirit of zeal and liberality on the part of several of the members, who, by entering into a subscription, have enabled the Council to defray nearly the whole expense of that useful and valuable work, without intrenching on the ordinary funds of the Society. And it may be mentioned, as a proof of the liberal spirit which animated those members, that the sum of 320*l.* was subscribed, within a few hours, towards the expense of publishing the Catalogue above alluded to.

The following brief abstract of the last year's accounts will shew that the state of the funds of the Society is such as to be a source of congratulation to the members.

Cash received.	£.	*s.*	*d.*
Balance last year ...	169	19	3
Resident members ..	228	18	0
Non-resident members	63	0	0
Compositions	37	16	0
Dividend on 800*l.* consols	24	0	0
Do. on 857*l.* 3*s.* 8*d.* 4 per cents.....	34	6	0
Sale of Memoirs....	149	11	5
Subscription to Catalogue	320	0	0
	£1027	10	8

Cash paid.	£.	*s.*	*d.*
Composition invested	25	4	0
Medals	28	1	7
Printer's bill	612	19	2
Rent	52	10	0
Sundry disbursements	65	6	8
Balance..	243	9	3
	£1027	10	8

The balance of 243*l.* 9*s.* 3*d.* consists of 144*l.* 8*s.* 10*d.* in the hands of the Treasurer, and 99*l.* 0*s.* 5*d.* due from the publishers, for books sold. This is properly the Cash Account of the Society; but there are a few other items outstanding, not included in the above, the balance of which is, however, in favour of the Society. For instance, there is still due to the printer the sum of 147*l.* 2*s.* 6*d.*: but, on the

other hand, there are some arrears of subscriptions not yet collected, which amount to 189*l*. This balance, together with the stock of Memoirs still unsold, will therefore increase the real value of the property of the Society.

The Council cannot too earnestly impress on the attention of the members, the necessity of encouraging the sale of the Memoirs as much as possible; since it is only by a quick return, arising from such sale, that they can expect to continue the publication, from year to year, without a serious diminution of the funds of the Society.

It appears from this Report that the total number of our members now amounts to 214, and of our associates to 32.

Among the accessions to our home list of members, in the year elapsed, the Council have to record, with all those sentiments of respect which his illustrious rank so peculiarly inspires, the name of His Royal Highness the Lord High Admiral; and they trust that this accession, so honourable in itself, and so gratifying to the Society, will be attended with the most beneficial results to the science which this Society was formed to promote, and which is so intimately connected in its practical application with the department over which His Royal Highness presides. Our home list has been further increased by the accession of fourteen new members, and our foreign, by that of one associate.

Among the losses sustained by death, the Society has to lament, in addition to Colonel Beaufoy, that of its most illustrious associate, Laplace: and on our home list, of the Rev. Lewis Evans; His Grace the Duke of Gordon; our amiable and excellent trustee, Mr. Daniel Moore (whose loss will be felt far beyond the limits of this body by many, as the privation of a benefactor, in whose ears the calls of distress never sounded in vain); Mr. W. M. Mosely; and Mr. J. Sanders.

Mr. Mosely, in addition to a competent knowledge of various sciences, had turned much of his attention, in the latter part of his life, to astronomy. He possessed several valuable instruments, and is said to have left behind him a series of observations of transits and north polar distances, and some measures of double stars confirmatory of their changes.

Mr. Evans also possessed instruments of considerable merit, and for several years employed himself as a skilful and successful observer.

It will not be expected that any sketch should here be attempted of the labours of M. de Laplace. No history of his scientific life, of the origin and developement of his views, adequate to the occasion, could be comprised in such limits as those of this Report; and the general nature of the more important results of his researches is already so well known, and so incorporated with the intellectual history of the last half century, that it constitutes a portion of the knowledge of every well-informed man. During the long period of fifty-five years, from the date of his first considerable mathematical production on the integration of equations of differences, in the *Turin Memoirs*, in 1772, to almost the moment of his death, his march was in the van of intellect; and the highest point of scientific attainment to which the age had reached, was uniformly marked by his progress.

His whole career was a succession of brilliant and profound discoveries, where every great step in the theoretical departments of analytical science was sure to be attended with a corresponding advance in its practical application; and every difficulty which occurred in applying his principles to the sublime problems of physical astronomy, served only to give rise to new methods, and create more powerful engines of mathematical inquiry; a rare combination,—of which Archimedes and Newton had afforded the only previous examples,—of a philosophical spirit of the first rank wielding all those unbounded resources of abstract science, which a few extraordinary men of a different turn may have perhaps possessed in an equal or superior degree, but which only attain their highest value when exerted from the vantage-ground of a mind at home in every department of experimental philosophy, impressed with the fullest sense of the importance of practical application, and familiar with all the means of disentangling principles from natural phenomena. Laplace also afforded a conspicuous instance of that union of gentle and amiable social qualities, which is one of the best characteristics of the highest order of genius — as indicating a mind secure of its rank. No pretension — no assumption — nothing dictatorial in science, or offensive in taste, marked his mild and modest deportment. They who have heard his sublimest views propounded with the diffidence of a youth seeking information; they whose early scientific attempts have been encouraged, and whose maturer efforts were assisted and directed by his talents, — will long retain a penetrating sense of this estimable feature of his character.

The only one of the prize questions proposed at the instance of the Council in February 1824, the period of which remained unexpired during the year elapsed, is that relating to the developement of the differential equations of the lunar theory, and the improvement of the lunar tables. No answer has been received to this question; and the proposed period has now expired. The Council have not thought it advisable either to prolong this period, or to propose any new questions for the present or future years: but, should subsequent researches either afford complete solutions of any of those questions, or material elucidations of their peculiar difficulties, future Councils will not fail to bear in mind the importance that attached to their subjects in the minds of former ones, and recommend to the Society the accordance of such marks of their approbation as the degree of progress made in them may appear to demand.

Two medals have been awarded this year by the Council. One to Sir Thomas Macdougal Brisbane, for the inestimable benefit conferred by him on astronomical science, in the establishment of his observatory at Paramatta in New South Wales, and for the valuable and important series of observations made there by himself, and under his directions, during his residence as governor of that colony. The other to Mr. James Dunlop, for his disinterested and indefatigable pursuit of astronomical researches, subsequent to the departure of Sir T. M. Brisbane from the colony of New South Wales, whereby he has added, in a most material degree, to our knowledge of the nebulæ of the southern hemisphere.

These medals will be delivered to these gentlemen respectively, or to their proxies, by the President, before the Society proceed to the business of election of the officers for the ensuing year.

By the fifth section of the regulations of the Society, every member is called upon to pay down four guineas at the time of his election, which appears not strictly equitable in those cases where members have been elected immediately preceding the anniversary in any year, when the annual contribution *again* becomes due. In order to meet this subject fairly, and with a due regard both to the interests of the new members and of the Society, it has been agreed by the Council, that it would be proper to divide the year into two parts: one commencing with the anniversary, and terminating with the session in June; and the other commencing from June, and ending with the next anniversary. The Council are of opinion, that those who are admitted in the latter part of the year should pay only three guineas on their election, whilst the regulation will remain in full force with respect to those who are elected in the first part of the year.

They are of opinion also, that a similar distribution should be made of the year in which any non-resident member may first become a resident member.

It has further appeared expedient to the Council, to propose an addition to one of the regulations relative to members who may be in arrears to the Society.

Regulations, which in the judgment of the Council will provide for these several cases, will be submitted to your consideration during the present meeting.*

The Council cannot conclude this Report without an earnest exhortation to the members of the Society, collectively and individually, to co-operate by their active exertions in the great cause for which the Institution exists. They entreat them to remember, that every one who possesses an instrument, whose claims rise even not above a humble mediocrity, has it in his power to chalk out for himself a useful and honourable line of occupation for leisure hours, in which his labour shall be really valuable, if duly registered: that those who possess *good* instruments, have a field absolutely boundless for their exertions. To such they would hold out the brilliant examples of many other of the members and associates of this Society,—of a Bessel, a Struve,—as shewing what may be accomplished by persevering industry, and how little reason there is to apprehend the failure of matter for their researches. They would strongly impress on the minds of all observers, however, whether private or public, the daily increasing necessity which exists for the *reduction* of their observations when made, and for the employment for that purpose of a uniform system of corrections adopted by common consent; and that, not when the work of many years shall have accumulated on hand till it shall have become overwhelming, but regularly, year by year—nay, month by month, while the immediate interest of the observations retains its freshness in the memory, and while their actual value can be checked, and the means of further refinement

* [The Regulations alluded to were adopted unanimously.—Sec.]

suggested and attained. The extreme facility afforded for these reductions by the Catalogue published by this Society, leaves no excuse for their neglect, when stars contained in it are observed; and it is most earnestly to be hoped, that no departure in other cases, from the co-efficients there used, will take place.

The Council would also strongly draw the attention of the members of the Society to the high importance, both for nautical and astronomical science, of observations of occultations, eclipses of the sun, and satellites of Jupiter, moon-culminating stars, and even ordinary lunar distances well and carefully observed on land, at fixed stations, such as observatories, and at all remarkable points in distant countries, where opportunities may offer. The Society will feel its utility most materially increased by the communication of such observations, if carefully made. No class of individuals have so frequent and available opportunities for such observations as naval officers, nor to any is the object of such direct utility. It is gratifying to know, that the requisite scientific attainments for such researches are already widely diffused among them, and daily becoming more so; and it is cheering to indulge the pleasing reflection, that the calls thus made upon them will not be unavailing.

(*The President then addressed the meeting on the subject of the award of the Medals, as follows:*—)

Gentlemen,—In pursuance of the award of your Council, which you have just heard, I have now to call your attention to the subject of the honorary marks of this Society's approbation, which it is part of our business at this meeting to bestow. The selection of objects on which such distinction may most deservingly and most usefully be conferred, has been, in this instance, of much interest and some difficulty,—not from a paucity of claims, but from their variety and magnitude. On all sides, both abroad and at home, the spirit of astronomical research and discovery has been diligently alive. The great work which has been commenced on the Continent, for the determination of the places of all the stars of our hemisphere in zones, has been continued with a patient ardour to which no words can do justice. The heavens have been ransacked for double stars; and the results of the search, developing a most rich and unlooked-for harvest of striking discoveries, being the first fruits of the great telescope of Fraunhofer, have been consigned to immortality, in a work which does honour to its age and nation, and which has already been brilliantly rewarded in another quarter. The ingenuity of one of our own countrymen has placed new, simple, and powerful means in the hands of observers, for verifying the stability of their instruments, and determining their fluctuations. And in every quarter, to go no further in this detail, an activity, worthy of the high ends and dignity of our science, has been remarkably displayed. Among so many important labours, however, some of which are yet awaiting their final completion, or receiving the last touches of their authors, the attention of your Council has been fixed by the imposing mass of valuable observations which has emanated, during a series of years, from the Observatory at Paramatta, established by the late governor

of the colony of New South Wales, Sir Thomas Macdougal Brisbane, one of our Vice-Presidents, long distinguished among us by his ardent love of astronomy, and an intimate familiarity both with its theory and practice.

Nothing can be more interesting in the eyes of an European astronomer, especially to those whose field of research, like our own, is limited by a considerable northern latitude,—than the southern hemisphere, where a new heaven, as well as a new earth, is offered to his speculations; and where the distance, the novelty, and the grandeur of the scenes thus laid open to human inquiry, lend a character almost romantic to their pursuit.

A celestial surface, equal to a fourth part of the whole area of the heavens, which is here for ever concealed from our sight, or whose extreme borders at least, if visible, are only feebly seen through the smoky vapours of our horizon,—affords to our antipodes the splendid prospect of constellations different from ours, and excelling them in brilliancy and richness. The vivid beauty of the Southern Cross has been sung by poets, and celebrated by the pen of the most accomplished of civilised travellers; and the shadowy lustre of the Magellanic clouds has supplied imagery for the dim and doubtful mythology of the most barbarous nations upon earth. But it is the task of the astronomer to open up these treasures of the southern sky, and display to mankind their secret and intimate relations. Apart, however, from speculative considerations, a perfect knowledge of the astronomy of the southern hemisphere is becoming daily an object of greater practical interest, now that civilisation and intercourse are rapidly spreading through those distant regions,—that our own colonies are rising into importance,—and that the vast countries of South America are gradually assuming a station in the list of nations, corresponding with their extent and natural advantages. It is no longer possible to remain content with the limited and inaccurate knowledge we have hitherto possessed of southern stars, now that we have a new geography to create, and latitudes and longitudes without end, to determine by their aid. The advantages, too, to be obtained, even for the perfect and refined astronomy of the north, by placing nearly a diameter of the globe between the stations of observatories, and taking up the objects common to both hemispheres, in a point of view, and under circumstances so every way opposite to those which exist here, have been strongly pointed out by a venerable and illustrious member of this Society, in an elaborate paper published in its Memoirs, and would alone suffice to justify a high degree of interest, as due to every well-conducted series of observations from that quarter. The observations of Halley, at St. Helena, had made known the places of a moderate number of the brighter southern stars; but the only catalogue of any extent and accuracy, which existed previous to the establishment of the observatories of the Cape and Paramatta, was that of Lacaille, who spent three years at the Cape of Good Hope, and the Isles of France and Bourbon; and, though with very inadequate instrumental means, yet, by dint of the most indefatigable industry, succeeded in observing and registering upwards of 10,000 stars. But by far the greater part of these observations

have never been reduced; a selection only from them of 1942 of the principal ones, not amounting to a fifth of their whole number, having been formed into a catalogue, and published by this meritorious astronomer. It must be admitted, however, that the degree of accuracy stated by Lacaille himself to have been probably attained by him, is hardly such as to make us now very deeply regret their want of reduction, especially as the observations themselves are printed with every requisite for that purpose, when required. Still, however, from his method of observing, which was with a fixed telescope and rhomboidal network, his observations have what may be termed a dormant value, as they most probably give correct differences for each night's work; and when a catalogue of standard southern stars shall be completed, Lacaille's observations will become available, by regarding these as zero points, and referring all the rest to them.

Such was nearly, with little improvement, the state of the astronomy of the southern hemisphere, when Sir Thomas Brisbane was appointed governor of the colony of New South Wales. The intention of our Government to found an observatory on the largest scale at the Cape of Good Hope was, indeed, already fixed; and the observer, a member of this Society, supplied with instruments sufficient for the purpose of constructing a preliminary catalogue, occupied himself with the necessary observations, while awaiting the arrival of those ultimately destined to adorn that establishment, and the building of his observatory. The approximate catalogue, so constructed and reduced, containing all the southern stars observed by Lacaille, down to the 5th magnitude, is already printed by the Royal Society, in their Transactions.

Sir Thomas Brisbane's attachment to astronomy had ever been a prevailing principle of his mind, and one which, even amidst the distractions of a military life of no ordinary degree of activity and adventure, he found means to indulge; and which never deserted him, however the calls of his country might demand his services in a different and more splendid career.

His appointment to the important office of governor of New South Wales, however, put it in his power to execute to their fullest extent, and under the most favourable circumstances, plans of astronomical investigation, which to a private individual would have been utterly impracticable. The opportunity was embraced with eagerness. The best instruments,—consisting of an excellent transit of $5\frac{1}{2}$ feet focal length, by Troughton; a mural circle of two feet in diameter, the workmanship also of Troughton, and said to have been the model on which that of Greenwich was constructed, and which had long been in his possession; and a fine 16-inch repeating circle of Reichenbach, —were destined for this service; and two gentlemen engaged as assistants, at considerable salaries,—the one a foreigner of high estimation as a mathematician and calculator; the other, Mr. Dunlop, of whom I shall presently have occasion to say much more. It ought to be mentioned, that this noble equipage was furnished entirely from Sir Thomas's private fortune, and maintained wholly at his own expense. Immediately on his arrival in the colony in 1821, and so

soon as an observatory could be erected, and the instruments established, the work of observation commenced, and continued, with little interruption, under the immediate superintendence and direction of Sir Thomas Brisbane himself; who, though the pressing and important duties of his high office would of necessity seldom admit of his devoting any material proportion of his time to actual observation, yet frequently took a personal share in the labours of the observatory, as a relaxation from higher duties, and in particular, a great portion of the transits were observed by himself.

The first fruits of this enterprise, were the observations of the December solstice of 1821, which were published in the Astronomical Notices of Schumacher; in which work also appear those of both the solstices of 1822, and a number of detached and occasional observations, which reached Europe at different times by a variety of channels, and found their way into that valuable collection. The solstices of 1823 were communicated by Sir Thomas Brisbane to this Society, in a letter to our late worthy president, together with a considerably extensive series of observations of principal stars, chiefly those visible in both hemispheres, and which have undergone a careful reduction and close scrutiny in the hands of Dr. Brinkley, the details of which, as well as the original observations, are printed in the first part of the second volume of the Transactions of this Society, and which justify, in the eyes of that experienced observer, as they must in those of every practical astronomer, a decided opinion of the great care and skill with which they have been made.

A great number of occasional observations,—such as eclipses, occultations, and observations of the planets Venus and Uranus, near their conjunctions and oppositions, and of comets from the same source,—are also printed in the same volume. One of the most remarkable single results we owe to the establishment of Sir Thomas Brisbane's observatory, consists in the re-discovery of the comet of Encke, in its predicted place, on the 2d June, 1822. The history of this extraordinary body is well known to all who hear me; and as its re-discovery at Paramatta by Mr. Rümker has already been, on a former occasion, distinctly noticed and rewarded by this Society, there is no occasion that I should here enlarge on it; and yet I cannot help pausing a moment to figure the delight its celebrated discoverer must have experienced, to find the calculations, on whose exactness he had pledged himself, thus verified beyond the gaze of European eyes; and this strange visitant gliding, as if anxious to elude pursuit, into its primitive obscurity, thus arrested on the very eve of its escape, and held up to mankind,—a trophy at once of the certainty of our theories, and the progress of our civilisation.

Observations of the length of the pendulum were not neglected by Sir Thomas Brisbane; and the determination of this important element at Paramatta forms the subject of a highly interesting and valuable communication made by him to the Royal Society, and printed by them in their Transactions for 1823, and discussed by Captain Kater with his usual care and exactness.

The remainder, and indeed the great mass, of the observations made with the mural circle and the transit instrument have, at

different periods, been communicated to the Royal Society, and are for the present deposited in its archives. Forming our judgment only upon those of which an account has been publicly read at the meetings of that illustrious body, but which are understood to constitute only a comparatively small part of the whole,—they form one of the most interesting and important series which has ever been made, and must ever be regarded as marking a decided era in the history of southern astronomy.

It is for this long catalogue of observations—whether scattered through the journals of Europe, printed in our own Transactions, or deposited as a precious charge in the care of a body so capable of appreciating their merits; but still more for the noble and disinterested example set by him in the establishment of an observatory on such a scale, in so distant a station, and which would have equally merited the present notice had every observation perished in its conveyance home—that your Council have thought Sir Thomas Macdougal Brisbane deserving the distinction of a medal of this Society, which, as he is unable personally to attend this meeting, I will now deliver to his proxy, Mr. South.

Mr. South,—We request you to transmit to Sir Thomas Brisbane this medal, accompanied with the strongest expressions of our admiration of the patriotic and princely support he has given to astronomy, in regions so remote. It will be a source of honest pride to him while he lives, to reflect that the first brilliant trait of Australian history marks the era of his government, and that his name will be identified with the future glories of that colony, in ages yet to come, as the founder of her science. It is a distinction truly worthy of a British governor. The colonial acquisitions of other countries have been but too frequently wrested from unoffending inhabitants, and the first pages of their history blackened by ferocious conquests and tyrannical violence. The treasures of gold and silver they have yielded—the fruits of rapine—have proved the bane of those who gathered them, and, in return, ignorance and bigotry have been the boons bestowed on them by their parent nations. Here, however, is a brighter prospect. Our first triumphs in those fair climes have been the peaceful ones of science; and the treasures they have transmitted to us are imperishable records of useful knowledge, speedily to be returned with interest, to the improvement of their condition and their elevation in the scale of nations.

(*The President then resumed his address to the Members, as follows:*—)

I have now to call your attention, gentlemen, to the award of another medal, to Mr. Dunlop, who accompanied Sir Thomas Brisbane in capacity of his assistant, and who, since the middle of the year 1823, when his companion, Mr. Rümker, left the observatory, remained in the sole charge of the instruments; and up to the period of the departure of his principal from the colony, continued an uninterrupted series of observations with a care and diligence seldom equalled, and never surpassed. In such cases, it is not only the head which plans, but the hand which faithfully and promptly executes,

that claims our applause. The most liberal provision of instrumental means would have been comparatively unavailing, had the spirit of him who supplied them been seconded by any ordinary zeal on the part of his assistants. The records of this Society already alluded to bear sufficient testimony to the merits of Mr. Rümker, and to our sense of them. In Mr. Dunlop were combined qualities rendering him of all others the very individual fitted for the duties imposed on him—zealous, active, ready—but, above all (and the combination is not an ordinary one), industrious and methodical. In the vast mass of observations made and registered by him, all is equable and smooth, as if the observations had all been made at a sitting:

"..... Servatur ad imum
Qualis ab incepto processerit"—

no lacunæ, no long intervals of inactivity, nothing hurried or sketchy,—but the same pains-taking, laborious filling in, pervading the whole; marking that the observer's whole heart and soul were in his work, and that each individual observation possessed its own peculiar, though momentary, interest. Nor is this wonderful. The heavens visible to Europeans have been so thoroughly examined, and their contents so carefully registered, that there is not the slightest rational probability of any thing new or uncommon offering itself to instruments of moderate power in the ordinary course of observation. Here, however, all was new; for the optical power of Lacaille's telescope was far too feeble to afford much insight into the physical constitution of the objects determined with it: and thus all the excitement of discovery was maintained during every step in the progress of the work.

But to be susceptible of this excitement, so maintained, the observer must be animated by the true spirit of the astronomer; and few have possessed this spirit in a greater degree than Mr. Dunlop. In a scientific point of view, therefore, he must be regarded as the associate, rather than the assistant, of his employer; and their difference of situation becomes merged in their unity of sentiment and object. These considerations alone would have rendered it impossible to your Council to disunite, in any expression or mark of their approbation, individuals who have thus, each in his sphere, gone hand in hand together towards the perfection of Southern Astronomy, even had the labours of Mr. Dunlop been confined to the ordinary business of an observatory, or to observations with fixed instruments. But this is very far from having been the case. The nebulous, as well as the sidereal heavens, have occupied his attention; and in the prosecution of this most delicate and difficult branch of astronomy, he has availed himself entirely of his own resources, in the most literal sense,—the instrument which he used being not simply his *own*, but the work of his own hands: and the observations being performed by him after the departure of Sir Thomas Brisbane from the colony, at a personal sacrifice of his private interests, and in the face of difficulties which would have deterred any one not animated with a real and disinterested love of science, from their prosecution. The results of these observations have been the description and determination of the places of upwards of 600 nebulæ

and clusters of stars. And when it is recollected that Lacaille was able to observe not more than about 40 or 50 of these curious objects, we may form some idea of the extent of this labour. In addition to these interesting results, Mr. Dunlop has amassed a copious and valuable collection of Southern double stars, which he is at present occupied in reducing and arranging; and a variety of interesting and curious particulars relative to the magnitudes, colours, and other peculiarities, of all the more conspicuous single ones.

Shut out as we are by our geographical situation from the actual contemplation of these wonders, the astronomers of Europe may view, with something approaching to envy, the lot of these their more fortunate brethren. The feeling, if an unworthy, is, however, but a passing one, and merges in that of admiration of their zeal and enterprise, and of gratitude for the information they have afforded us. In testimony of that admiration and that gratitude, on the part of this Society, towards Mr. Dunlop, I beg of you, Mr. South, to transmit to *him* also, this our medal, and to accompany it with the assurance, that wheresoever his future fortunes may lead him — whether in the land which has already witnessed his meritorious labours, to complete and extend them; or in his native country, which is both able and willing to appreciate his value, to put the finishing stroke to the noble fabric he has been mainly instrumental in raising, by taking a leading part in the less exciting, but not less useful or indispensable work, of reducing the observations already made — in either case, he will be attended by our best wishes for his prosperity and happiness, and our confidence that science will continue to benefit by his exertions.

(*The President having quitted the chair, was succeeded by* Mr. South, *one of the Vice-Presidents, who addressed the Meeting as follows:*—)

Gentlemen,—Our excellent President, in his address, has informed you of the appropriation of two of your gold medals since our last Anniversary: a third, however, has been decreed by your Council; and when it is known that Miss Caroline Herschel is the individual to whom it stands adjudged, it is not difficult to determine why the President has avoided the slightest allusion to it.

But that your Council has not selected one from the many of its members, infinitely more competent to do justice to the transcendent merits of that illustrious lady, is, most assuredly, matter of regret. I must, therefore, throw myself upon your indulgence, hoping that the goodness of the cause may in some measure compensate for the inability of its advocate.

The labours of Miss Herschel are so intimately connected with, and are generally so dependent upon, those of her illustrious brother, that an investigation of the latter is absolutely necessary ere we can form the most remote idea of the extent of the former: but when it is considered that Sir W. Herschel's contributions to astronomical science occupy sixty-seven Memoirs, communicated from time to time to the Royal Society, and embrace a period of forty years, it will not be expected that I should enter into their discussion. To

the Philosophical Transactions I must refer you, and shall content myself with the hasty mention of some of her more immediate claims to the distinction now conferred. To deliver an eulogy (however deserved) upon *his* memory is not the purpose for which I am placed here.

His first catalogue of new nebulæ and clusters of stars, amounting in number to one thousand, was made from observations with the 20-feet reflector, in the years 1783, -4, and -5. A second thousand were furnished by means of the same instrument in 1785, -6, -7, and -8; whilst the places of five hundred others were discovered between 1788 and 1802. But when we have thus enumerated the results obtained in the course of *sweeps* with this instrument, and taken into consideration the extent and variety of the other observations, which were at the same time in progress, a most important part yet remains untold. Who participated in his toils? Who braved with him the inclemency of the weather? Who shared his privations?—A female! Who was she?—His sister! Miss Herschel it was who by *night* acted as his amanuensis! She it was whose pen conveyed to paper his observations as they issued from his lips; she it was who noted the right ascensions and polar distances of the objects observed; she it was who, having passed the night near the instruments, took the rough manuscripts to her cottage at the dawn of day, and produced a fair copy of the night's work on the subsequent morning; she it was who planned the labour of each succeeding night; she it was who reduced every observation, and made every calculation; she it was who arranged every thing in systematic order; and she it was who helped him to obtain an imperishable name.

But her claims to our gratitude end not here. As an original observer she demands, and I am sure she has, our most unfeigned thanks. Occasionally, her immediate attendance during the observation could be dispensed with. Did she pass the night in repose? No such thing: wherever her illustrious brother was, there you were sure to find her also. A sweeper planted on the lawn became her object of amusement; but her amusements were of the higher order, and to them we stand indebted for the discovery of the comet of 1786, of the comet of 1788, of the comet of 1791, of the comet of 1793, and of the comet of 1795, since rendered familiar to us by the remarkable discovery of Encke. Many also of the nebulæ contained in Sir W. Herschel's catalogues were detected by her during these hours of enjoyment. Indeed, in looking at the joint labours of these extraordinary personages, we scarcely know whether most to admire the intellectual power of the brother, or the unconquerable industry of the sister.

In the year 1797, she presented to the Royal Society a catalogue of 560 stars, taken from Flamsteed's observations, and not inserted in the British Catalogue; together with a collection of errata that should be noticed in the same volume.

Shortly after the death of her brother, Miss Herschel returned to Hanover. Unwilling, however, to relinquish her astronomical labours whilst any thing useful presented itself, she undertook, and completed, the laborious reduction of the places of 2500 nebulæ, to the 1st Jan. 1800, presenting in one view the results of all Sir

William Herschel's observations on those bodies; thus bringing to a close half a century spent in astronomical labour.

For this more immediately, and to mark their estimation of services rendered during a whole life to astronomy, your Council resolved to confer on her the distinction of a medal of this Society. The peculiarity of our President's situation, however, and the earnest manner in which the feelings, naturally arising from it, were urged when the subject was first brought forward, caused your Council to pause, and wave, on that occasion, the actual passing their proposed vote. The discussion was, however, renewed on Monday last; and although there was every disposition to meet the President's wishes, still, under a conviction that the doing so would have been a dereliction of public duty, it was

Resolved unanimously, "That a Gold Medal of this Society be given to Miss Caroline Herschel, for her recent reduction, to January 1800, of the Nebulæ discovered by her illustrious brother, which may be considered as the completion of a series of exertions, probably unparalleled, either in magnitude or importance, in the annals of astronomical labour." A vote which I am sure every one whom I have the honour to address will most heartily confirm.

Mr. HERSCHEL,—In the name of the Astronomical Society of London, I present this Medal to your illustrious Aunt. In transmitting it to her, assure her, that since the foundation of this Society, no one has been adjudged which has been earned by services such as hers. Convey to her our unfeigned regret that she is not resident amongst us; and join to it our wishes, nay, our prayers, that as her former days have been glorious, so her future may be happy.*

List of Officers for the ensuing year.

President: J. F. W. Herschel, Esq. M.A. V.P.R.S. L. & E. F.G.S. & M.R.I.A.—*Vice-Presidents:* Francis Baily, Esq. F.R.S. L.S. & G.S. & M.R.I.A.; Lieut.-Gen. Sir T. M. Brisbane, K.C.B. F.R.S. L. & E.; Davies Gilbert, Esq. M.P. *Pres.* R.S. F.L.S. & G.S.; James South, Esq. F.R.S. L. & E. F.L.S. & M.R.I A.—*Treasurer:* Rev. William Pearson, LL.D. & F.R.S.—*Secretaries:* Olinthus G. Gregory, LL.D. *Prof. Math. Roy. Mil. Acad. Woolwich*; Lieutenant William S. Stratford, R.N.—*Foreign Secretary:* Charles Babbage, Esq. M.A. F.R.S. L. & E. & M.R.I.A.—*Council:* Capt. F. Beaufort, R.N. F.R.S.; Henry Thomas Colebrooke, Esq. F.R.S. L. & E. F.L.S. & G.S.; Lieut.-Col. Thomas Colby, R.E. LL.D. & F.R.S. L. & E.; Benjamin Gompertz, Esq. F.R.S.; Rev. Dionysius Lardner, M.A. & M.R.I.A.; Rear Adm. Sir Edw. C. R. Owen, K.C.B.; Edw. Riddle, Esq.; Rev. Rich. Sheepshanks, M.A.; Capt. W. H. Smyth, R.N. F.R.S. &. A.S.; Edward Troughton, Esq. F.R S. L. &. E.

* He who has the honour to deliver this hasty address, feels no slight gratification in having been present, on the 1st of June, 1821, at the last observations, with the 20-feet reflector, in which Miss Herschel was engaged. He remembers also, not without regret, but with becoming gratitude, that, for his improvement, the mirror used on the occasion was inserted, for the last time, in the tube, by the hands of Sir W. Herschel.

J. Moyes, Castle Street, Leicester Square.